



AN2100™ System

General Description

Technical Manual 76.2100/1

Revision A, 3/99

© 1999, Tellabs Operations, Inc., 4951 Indiana Ave., Lisle IL 60532

630.378.8800

All rights reserved. Printed in the United States of America.

**FCC Notification
Statement**

Federal Communications Commission (FCC) Rules require that you be notified of the following:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by Tellabs Operations, Inc., in writing can void the user's authority to operate the equipment.

Notice of Copyright

The Tellabs software program that you have purchased is copyrighted by Tellabs or its licensors, and your rights of ownership are subject to limitations and restrictions imposed by the copyright laws as outlined below.

It is against the law to copy, reproduce, or transmit (including, without limitation, electronic transmission over any network) any part of the program except as permitted by the copyright act of the United States (Title 17, United States Code).

Contact Information

In an effort to improve the quality of this document, please notify Tellabs Technical Assistance at 800.443.5555 if any anomalous conditions are observed or for documentation-related improvements.

Contents**Page****Section 1**

Introduction	1-1
AN2100 System Overview	1-1

Section 2

Applications	1-3
Features	1-3

Section 3

AN2100 Architecture	1-7
Introduction	1-7
AN2100 Physical Description	1-7
System Configuration	1-7
Physical	1-7
Dimensions.....	1-7
System Layout	1-7
ATM Aggregate Shelf and ATM Expansion Shelf Layout.....	1-9
Paddle Module Connection Area	1-9
Main Module Area.....	1-9
System Alarms.....	1-10
Grounding Strap Jack	1-10
Fan Enclosure.....	1-10
Mounting Flange	1-10
ATM Expansion Shelf Modules	1-11
ATM Aggregate Shelf Modules	1-13
SONET Tributary Shelf	1-15
ATM Aggregate Shelf and ATM Expansion Shelf Module Structure	1-16
Paddle Module	1-16
Module Connections.....	1-16
AN2100 Logical Description	1-17
Introduction	1-17
Intershelf Data Flow.....	1-17
Intershelf Control Flow.....	1-17
TDM to ATM	1-18
5542A OPM3 Module (OPM3)	1-18
5544T MM3T Mapping Module (MM3T).....	1-18
212010 Switch Module (SWM).....	1-18
212004 Expander Module (EXM).....	1-18
212030 Voice Processing Module (VPM).....	1-19
212003 Aggregate OC-3c Module (AGM)	1-19
ATM to TDM	1-19
212003 Aggregate OC-3c Module (AGM)	1-19
212030 Voice Processing Module (VPM).....	1-19
212004 Expander Module (EXM)	1-19
212010 Switch Module (SWM).....	1-19
5544T MM3 Mapping Module (MM3T).....	1-19
AN2100 Intershelf Connections	1-19
System Buses.....	1-20
TDM Data Flow	1-20
ATM Data Flow.....	1-20
Control Link	1-21
ATM Aggregate Shelf and ATM Expansion Shelf Modules.....	1-22
212013 Power Filter Module (PFU)	1-24

Contents**Page**

Location.....	1-24
Description	1-24
212005 Alarm Paddle Module (ALP)	1-25
Location.....	1-25
Description	1-25
212008 Expander Paddle Module (EXP).....	1-25
Location.....	1-25
Description	1-25
212014 Craft Controller Paddle Module (CCP)	1-25
Location.....	1-25
Description	1-25
212006 OSS/Controller Paddle Module (MCP)	1-25
Location.....	1-25
Description	1-25
212007 OC-3c Paddle Module (OSMP)	1-26
Location.....	1-26
Description	1-26
212001 Power Supply Module (PSM).....	1-26
Location.....	1-26
Description	1-26
212004 Expander Module (EXM)	1-27
Location.....	1-27
Description	1-27
212002 Controller Module (MCM)	1-27
Location.....	1-27
Description	1-27
212003 Aggregate OC-3c Module (AGM)	1-28
Location.....	1-28
Description	1-28
212030 Voice Processing Module (VPM).....	1-28
Location.....	1-28
Description	1-28
9705 Fan Assembly	1-28
Location.....	1-28
Description	1-28
212017 Disk Drive Module.....	1-28
Location.....	1-28
Description	1-28
SONET Tributary Shelf Modules	1-29
5535 Power Supply - Network and Port Module (PSNP).....	1-29
Location.....	1-29
Description	1-29
212010 Switch Module (SWM)	1-30
Location.....	1-30
Description	1-30
212011 Group Controller Module (GCM).....	1-30
Location.....	1-30
Description	1-30
5542A-FC OPM3 Short/Intermediate Port Module (OPM3).....	1-30
Location.....	1-30
Description	1-30
5544T MM3T-Mux Mapping Module (MM3T)	1-31
Location.....	1-31
Description	1-31

Contents**Page****Section 4**

CraftStation Overview	1-32
Introduction	1-32
CraftStation Interface	1-33
Alarms.....	1-33
Configuration Management	1-34
Diagnostics	1-34
Performance Management	1-34
Network Topology	1-34
System Management.....	1-34
SNMP MIB Browser.....	1-35
External Interface Requirements	1-35
Equipment Interfaces	1-35
User Interfaces	1-35

Section 5

Operations and Maintenance Features	1-36
Introduction	1-36
Maintenance.....	1-36
Diagnostics.....	1-36
Troubleshooting	1-37
System Integrity	1-37
Management and Control Interfaces	1-37
Protocols	1-37
Physical Connections for Management and Control	1-37
Clocks and Synchronization	1-38
System Clocks.....	1-38
Timing.....	1-38
BITS Clock	1-38
Internal Clock	1-38
Alarm Interfaces.....	1-38
System Alarms	1-38
User and External Alarms	1-38
Equipment Redundancy	1-38
System.....	1-38
Control	1-39
Bus.....	1-39
Power.....	1-39
Intershelf Connections	1-39
Facility Integrity	1-39
Regulatory Compliance	1-39

Section 6

External Connections to the AN2100	1-40
Introduction	1-40
ATM Aggregate Shelf.....	1-40
Power Connections	1-40
ATM Connections.....	1-40
CraftStation Connections	1-40
Management Connections	1-40
NMS	1-40
CMS	1-40
BITS Clocks Connections.....	1-40

Contents**Page**

ATM Expansion Shelf.....	1-41
Power Connections	1-41
SONET Tributary Shelf	1-41
Power Connections	1-41
TDM Connections.....	1-41

Section 7**Acronyms****1-42**

List of Acronyms.....	1-42
-----------------------	------

Section 8**Index****1-45**

1. Introduction

1.01 This manual describes the AN2100 system, applications, connections, architecture, and logical descriptions. The CraftStation is a windows-based application that can manage the AN2100 system. A description of the CraftStation's features and functional requirements is provided in this document. Refer to *AN2100 Provisioning, 76.2100/5* for more detail. The Operations and Maintenance features are also described in this document. For more details, refer to *AN2100 Maintenance, 76.2100/6*.

AN2100 System Overview

1.02 The Tellabs AN2100™ system is a network element for adapting time division multiplexed (TDM) based voice traffic onto an asynchronous transfer mode (ATM) backbone network. The system combines DS0-level cross connection, echo cancellation and ATM adaptation functions.

1.03 The AN2100 system adapts TDM DS0s (Digital Signal, Level 0) into ATM Virtual Channel Connection (VCC) cell streams using ATM Adaptation Level 1 (AAL1). An option to perform echo cancellation on individual DS0s also exists. Each DS0 can be assigned to an ATM VCC using a virtual channel identifier (VCI) and virtual path identifier (VPI). In addition, DS0s can be connected to each other within and among the two OC-3 TDM tributaries. Connection management is performed using a pair of Ethernet interfaces to an external controller. However, OSS management occurs using the Simple Network Management Protocol (SNMP) over a pair of Ethernet interfaces. An option for element management exists using Tellabs CraftStation software, which resides on a personal computer. CraftStation software provides access to alarm and performance management information.

1.04 The network topology using two AN2100 Systems and the control mechanisms required to establish and maintain a TDM-to-ATM and TDM-to-TDM connection is shown in Figure 1.1. This figure shows various network interconnections of the AN2100 also. Typically, the connection management system supplies provisioning information, such as Time Division Multiplexing (TDM) to Virtual Path Identifier/Virtual Channel Identified (VPI/VCI) addressing. The Operation Support System (OSS) is used to monitor the status of the network elements and network.

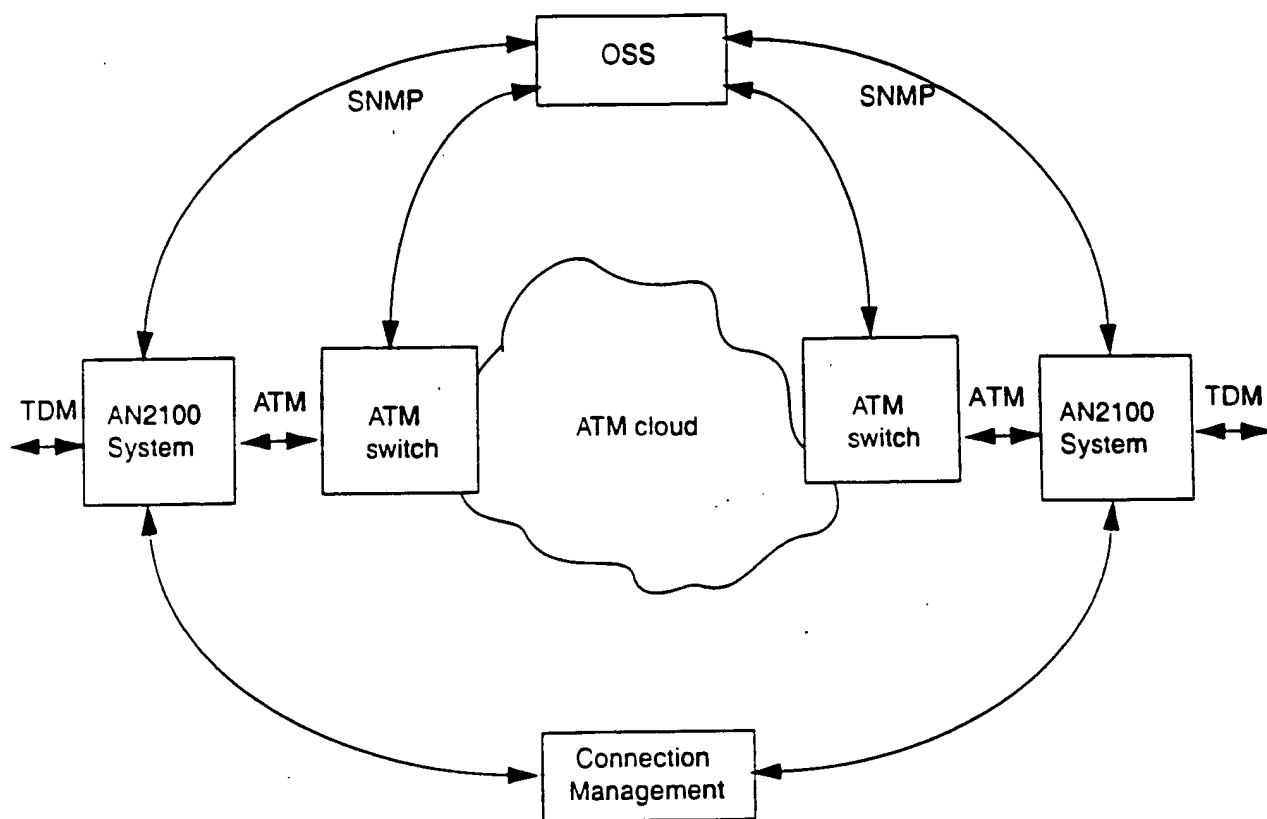


Figure 1.1 Network Topology

2. Applications

2.01 The AN2100 provides connection of local exchange to ATM. Refer to Figure 2.1.

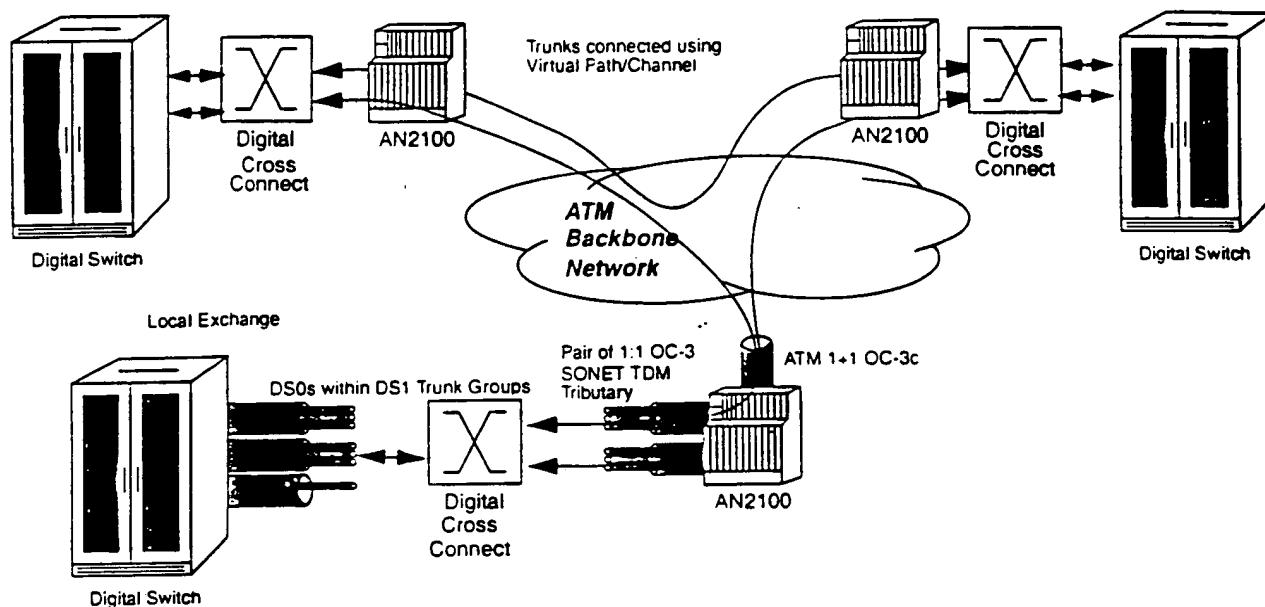


Figure 2.1 Intermachine Trunks Over ATM

2.02 Adapting local exchange traffic to ATM allows the traffic to be transported over an ATM backbone for the following purposes:

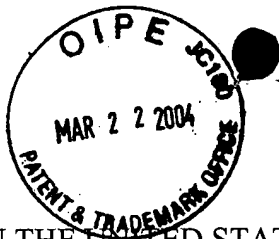
- Combining local exchange traffic with data to gain efficiencies of operation over a single network
- An additional level of protection in the ability to reroute using ATM-level connectivity

2.03 Thus, the AN2100 supports 2:1 concentration with the two working OC-3 TDM tributaries.

Features

2.04 The AN2100 provides the following features:

- AAL1 adaptation to ATM on a per-DS0 basis
- Per-DS0 echo cancellation
- High-speed, protected (1 +1 SONET) access on both the tributary (OC-3) and aggregate (OC-3c) facilities
- Selective mapping of 2016 individual incoming DS0s out of a possible 4032 to 2016 available ATM VCCs



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Scholtens et al.

Art Unit : 2662

Serial No. : 09/632,393

Examiner : Michael I. McLoughlin

Filed : August 4, 2000

Title : CIRCUIT INTEGRITY IN A PACKET-SWITCHED NETWORK

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RECEIVED

MAR 24 2004

Technology Center 2600

DECLARATION OF PAUL A. LEVY

I, Paul A. LEVY declare as follows:

- 1 I am an attorney employed by:

Fish & Richardson P.C.
45 Rockefeller Plaza, Suite 2800
New York, NY 10111

- 2 In July 1999, Fish & Richardson P.C. received a written request to prepare a patent application in connection with the subject matter of the application identified above.

- 3 Fish & Richardson P.C. prepared and filed a provisional application including that subject matter on August 6, 1999.

- 4 I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the above-identified application or any patents issued thereon.

Signature: 

Date: March 19, 2004

Typed/Printed Name: Paul A. Levy